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OLD GROWTH FORESTS

BUILDING CONSERVATION STRATEGIES



Interim Report on Conserving Old Growth Red and White Pine

Old Growth
Policy Advisory Committee

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

 Ontario

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EXECUTIVE SUMMARY

In recent years, public concern has risen over how the province's forests are managed. This concern has crystallized around the need to conserve old growth forests, and the need to resolve resource allocation conflicts between the forestry industry and other users.

In response to growing public concern about the state of old growth forests, the Honourable Bud Wildman, then Minister of Natural Resources, established the Old Growth Conservation Initiative in January 1992. Central to this initiative is the Old Growth Policy Advisory Committee (PAC), which was given a mandate to develop recommendations for conserving old growth forest ecosystems in Ontario. The Old Growth PAC, which reports directly to the Minister of the Natural Resources, is an independent citizens committee with membership from across the province. The Committee's composition reflects the many different perspectives of Ontario: the forest and mining industries, labour, First Nations, environmental and conservation groups, and the faith and education communities.

The Minister requested PAC to prepare an interim report addressing the conservation of old growth red and white pine forest ecosystems, to be followed by a final report which encompasses all old growth types. This Report describes what the Committee has done to date, outlines the results of their public consultation, and presents a definition of "old growth forest ecosystems" and recommendations for conserving old growth red and white pine.

During their first year PAC received presentations on the history, ecology and socio-economic aspects of old growth forests in Ontario. They visited old growth forests, and viewed cutting practices and regeneration techniques. In addition to meeting monthly as a committee, PAC met three times with the Old Growth Scientific Advisory Committee.

The Policy Advisory Committee's public consultation program was designed to involve the public in developing an old growth forest conservation strategy. In September 1992 a Discussion Paper was released to provide a focus for the consultation program. Opportunities for involvement included a questionnaire inserted in the Discussion Paper, and four regional workshops, a sectoral workshop and a resource managers workshop that were held in October and November, 1992. Over 500 people attended these workshops, 250 questionnaires were completed and about 50 letters and submissions were received.

The public suggested that the definition of "old growth forests" should be ecosystem-based; resource managers suggested that it be accompanied by an index or classification system. Many participants argued that it was impossible to "preserve" old growth red and white pine forests as they eventually are replaced by other species. Many argued that the simple preservation of old growth forests will not guarantee the presence of old growth in the future — that the focus

of the conservation strategy should be on protecting and maintaining red and white pine in all age classes. There was general agreement that emphasis should be on ecosystems, not trees, and that the protection of ecosystem health is of paramount importance.

Because so little old growth red and white pine remains, participants were generally supportive of interim protection of all old growth stands, providing decisions could be made quickly on which stands should receive continued protection. Many people felt that some existing old growth should be protected from all human intervention, although there was disagreement over the size of the land base that should be reserved in this way. People felt that other old growth areas should be managed for old growth characteristics and for red and white pine renewal. There was considerable support shown for the regeneration of red and white pine across the landscape in areas where it had once grown.

Many participants raised concerns about the economic impacts of strategies such as blanket protection policies. They spoke of the need to balance jobs and the environment, the need for fairness, and the need for compensation in communities where old growth red and white pine was removed from production. In general, the prevailing view expressed was that economic and regional concerns must be addressed, but within a larger, long-term vision of ecosystem health for Ontario's forests.

Recommendations

The Policy Advisory Committee has developed a definition for old growth forest ecosystems based on the input received from the public and on advice from the Scientific Advisory Committee:

"Old growth forests are ecosystems characterized by the presence of old trees with their associated plants, animals and ecological processes. They are reflective of the pre-settlement forest."

The Committee recognizes the need for a multi-faceted old growth conservation strategy which includes the following components:

- Inventory and Information;
- Research;
- Protection;
- Forest Management Practices; and
- Restoration.

For the complete text of recommendations, the entire Interim Report should be read.

The recommendations on **Inventory and Information** are aimed at improving the understanding of the resource and guiding decision-making at all levels. The recommendations, in general, support and complement work already being done by the Ontario Ministry of Natural Resources (OMNR). In brief, it is recommended that OMNR develop an integrated information system that is compatible with existing resource data bases and Geographic Information Systems. District and regional field staff should be trained to use the integrated information system.

PAC's recommendations on **Research** are divided into four categories. Research is needed to develop an Old Growth Index: this will provide a tool for identifying and assessing potential old growth sites. Ecological research is required to gain a better understanding of old growth structure and function, and the role of disturbance in red and white pine ecosystems. Research into Management Practices is needed to develop management techniques that will allow old growth characteristics to be retained and enhanced. Socio-economic research is needed to provide tools for decision-making and assessing the impacts of decisions.

The recommendations on **Protection** focus on the need to protect old growth red and white pine on a site district basis as part of a network of ecologically representative areas. This will require amending OMNR's criteria for life science representation to specifically include old growth red and white pine ecosystems. Old growth pine areas that are selected for protection should be designated under specific legislation, such as an Ecological Reserves Act, or an amended Parks Act. Old growth in existing provincial and federal parks should be evaluated for its contribution to ecological representation by site district. A similar evaluation should be done for old growth areas identified in Site Region 4E by an OMNR survey in 1991. Outside Site Region 4E, old growth pine areas should be identified and evaluated for their contribution to site district representation. Cutting in identified old growth red and white pine areas should be deferred until the selection of ecologically representative areas for protection in each site district is complete. Where a choice of areas of similar ecological value exists which could provide site district representation, socio-economic impacts should be used to help make the selection for ecological representation. Where the establishment of protected areas results in mill closures, the Minister of Natural Resources should confer with federal and provincial agencies to explore the possibilities for retraining, relocation assistance, and the establishment of adjustment committees.

The recommendations on **Forest Management Practices** centre on the need to retain old growth structural characteristics in areas being harvested. These include snags, downed logs, and trees with dead or dying tops. Resource managers should use silvicultural techniques that promote the regeneration of red and white pine, preferably by natural means. Programs should be developed for training field staff in the management of old growth forests and old growth forest ecosystems. An audit program should be developed to monitor the delivery of old growth management recommendations, monitor for compliance, and re-evaluate policies, objectives and targets.

The Committee recommends a **Restoration** program to increase the level of red and white pine on the landscape. Targets for restoration should be established at the management unit level, and should have consistent standards for assessing the program's effectiveness.

Next Steps

The Policy Advisory Committee's mandate for its second year is to develop a conservation strategy for Ontario's old growth forest ecosystems. The Committee will determine which other forest ecosystems should be included in its final strategy recommendations. PAC will also address issues of land ownership, and managing old growth ecosystems on the landscape. The Committee will develop further linkages with other related programs and policy initiatives.

The Scientific Advisory Committee will continue to provide input into strategy development in PAC's second year and will be expanded to include members with expertise in the social sciences. There will be increased interaction between PAC, the Scientific Advisory Committee and the scientific community. In addition, a network of resource managers from both the public and private sectors is being developed to advise PAC on operational matters. Public consultation will continue in Phase 2, using mailings, focus groups and general consultations. The Committee will continue to involve those members of the public who participated in Phase 1. The Committee's final report is due at the end of 1993.

INTRODUCTION

Preamble

The province of Ontario is naturally a forested land. Residents cherish forests for their intrinsic beauty and value as natural systems, as retreats from the pressures of modern life, as habitat for wildlife, sources for timber and firewood, and for dozens of other reasons. Increasingly, the public has been concerned with how the province's forests are managed and this concern has crystallized around old growth forest issues.

In the last two decades public concern worldwide about the loss of old growth forests has grown dramatically. The forests of Brazil, Borneo, Haiti, British Columbia and the US Pacific northwest have been seen to be falling beneath the axe, sacrificed for short-term interests, for ranchland, charcoal, firewood and lumber. In the late 1980s conflicts over logging in Ontario's old growth red and white pine forests intensified, and public concern came to a head over this issue in the Temagami area. During the same time period the World Commission on Environment and Development (better known as the Bruntland Commission) released its compelling report, *Our Common Future*. In this report the Bruntland Commission championed the notion of "sustainable development" which it defined as "development which meets the needs for the present generation without compromising the ability of future generations to meet their own needs."

Public concern about the cutting of old growth forests is consistent with a general anxiety about overall environmental degradation and a growing realization of the need for sustainability in resource use. But it also reflects the growing conflicts between users of these valuable resources. There are many values associated with old growth forests. They are prized by the forest industry. Old growth forests provide habitat for wildlife and help maintain biodiversity. Like all forests, they are also used for trapping, hunting, mining, tourism, camping, gathering, hiking, cottaging, research, and for solitude and wilderness experience. To many First Nations people, old growth forests are simply home. Several values of old growth forests are not compatible with forest industry use and conflicts can occur because of resource allocation.

In January 1992, in response to growing public concern about Ontario's old growth forests, the Honourable Bud Wildman, then Minister of Natural Resources, established the Old Growth Conservation Initiative. Central to this Initiative was the creation of the Old Growth Policy Advisory Committee (PAC). The Committee's mandate is to develop strategy recommendations for conserving old growth forest ecosystems in Ontario. The strategy recommendations will:

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- provide a working definition of old growth forest ecosystems and determine which forest ecosystems should be included for old growth consideration;
 - identify information needs for locating and cataloguing old growth forest ecosystems;
 - describe the particular biological, social, cultural and economic values associated with old growth;
 - develop a framework for the conservation of representative old growth forest ecosystems now and into the future;
 - identify appropriate resource management practices that may be used to maintain old growth characteristics; and
 - recommend studies required to gain a better understanding of the characteristics and values associated with old growth forest ecosystems.

The Old Growth Conservation Initiative is one of the Ontario Ministry of Natural Resources' (OMNR's) Sustainable Forestry Initiative programs.¹

The Old Growth PAC reports directly to the Minister of Natural Resources and is an independent citizens committee with membership from across the province. The Committee members reflect perspectives of the many different people who have an interest in old growth: the forest and mining industries, labour, First Nations, environmental and conservation groups, and the faith and education communities. PAC members share an interest in old growth forest ecosystems, and in finding ways to ensure that these important ecosystems remain in the landscape over the long term.

The Policy Advisory Committee is assisted by a Scientific Advisory Committee (SAC) made up of natural scientists. Their role is to provide PAC with scientific information and advice. PAC is also assisted in its work by a Secretariat within the Ministry of Natural Resources.

Three philosophical principles are central to the Committee's work and provide a basis for its actions. First is the members' belief that protecting ecosystem function should be the highest priority in resource management decision-making. The second principle recognizes the need to take an ecosystem approach in developing a conservation strategy for old growth forests. An ecosystem approach means considering species other than humans and generations other than this one. A third principle is the need for fairness in developing an old growth forests conservation

¹ Appendix D contains a description of other programs in the Sustainable Forestry Initiative.

strategy. PAC intends to address the social, cultural and economic impacts that its recommendations will have on communities and individuals.

The Policy Advisory Committee has also adopted two operating principles. The first of these is to value public input in decision-making. PAC believes that the public has a right to be involved in developing resource policies, and that public involvement will result in decisions that have broad support and will thus be more likely implemented. The final principle that has guided the Committee is the commitment to operate by consensus. PAC believes that sound policy recommendations are best developed by understanding and appreciating each other's values, needs and interests. This report is the result of a year's worth of listening to and learning from each other and the public, and operating by consensus.

The Committee recognizes aboriginal and treaty rights as affirmed by the 1982 Canadian Constitution. The inherent right to self-government of aboriginal peoples is acknowledged in the Statement of Political Relationship signed between the Ontario government and the First Nations. The recommendations in this report or their implementation will not prejudice any negotiations between the Ontario government and any aboriginal peoples, or infringe upon the authority of the First Nations.

This interim report does three things. First, it is a status report on the activities of the Old Growth Policy Advisory Committee. As such, it describes what the Committee has done in Phase 1, from January 1992 to March 1993, including presenting the results of public consultation during this time. Second, as requested by the Minister, it presents a definition of "old growth forest ecosystems" and recommendations for conserving old growth red and white pine ecosystems. Third, the report describes the proposed activities of PAC in the second phase of its work in 1993.

THE FIRST YEAR

What We've Done

During Phase 1 of developing the old growth forest ecosystems conservation strategy the Old Growth Policy Advisory Committee met an average of two days each month. The Committee focused on developing a schedule for its work, increasing members' understanding of old growth issues, developing and implementing a public consultation program, and determining a set of policy recommendations for old growth red and white pine.

During this phase the Committee received presentations on topics such as: landscape and forest ecology; old growth forests in British Columbia; social values associated with old growth forests; relations between the provincial government and the First Nations; and the Ministry's Endangered Spaces Initiative. To further increase members' understanding of old growth forests, PAC took four field trips to view old growth forest ecosystems and to see cutting practices, regeneration techniques, and other aspects of forest management.²

Policy Advisory Committee members met with the Honourable Bud Wildman in December 1992 to discuss matters of mutual interest including the value of public consultation and linkages between the Old Growth Conservation Initiative and other OMNR programs. Understanding the importance of such links, PAC has communicated regularly with other people involved in the Sustainable Forestry Initiative and, together with the Forestry Policy Panel, initiated a Policy Coordination and Linkage Workshop in February 1993.

Throughout Phase 1 PAC members attended Scientific Advisory Committee (SAC) meetings, and the Chair of SAC sat as an ex-officio member of the PAC. The committees met together in April 1992, December 1992 and March 1993. In Phase 1 the Scientific Advisory Committee provided PAC with their understanding and views on matters relating to the ecology of old growth forests, and provided an ecological review of the Interim Report.

The consultation program was designed to involve the public in developing an old growth forests conservation strategy. The program was initiated with the release in September 1992 of a Discussion Paper that described the Old Growth Conservation Initiative and provided a historical perspective on the old growth issue. The Paper also described some of the values associated with old growth forests, presented a preliminary definition for "old growth forests" and offered a spectrum of options to conserve red and white pine. A questionnaire was included in the Discussion Paper to elicit public opinion on old growth values, on the definition of old growth

² Details of presentations made to PAC and field trips are included in Appendix C.

forests presented in the Paper, and on interim management options for red and white pine. Members of the public were encouraged to complete the questionnaire, or to contact the Committee by phone, letter or written brief.

Opportunities for input included a series of regional workshops held in Pembroke (October 14), Guelph (October 15), Thunder Bay (October 21), and Sudbury (October 22, 1992). A sectoral workshop for representatives of various organizations with an interest in old growth was held in Toronto on November 13, 1992, and a workshop for forest resource managers was held in Sudbury on November 30, 1992.

The information, opinions and ideas received from the public were reviewed and analyzed. A detailed account of the public consultation program has been published in a document entitled *What We Heard: A Report on Public Consultations on Red and White Pine*.

What We Heard

Many people participated in the Phase 1 consultation program. About 50 letters and submissions were received and more than 250 questionnaires were completed. About 450 people attended the regional workshops, 34 attended the sectoral workshop, and 46 attended the workshop for resource managers. Generally the response to the consultation program was quite positive and dialogue was constructive and thoughtful. Transcripts were made of the public consultation sessions and used as a basis for the analysis of public input.

Developing effective public policy on old growth requires a common understanding of what old growth is. A definition of old growth forests was presented in the Discussion Paper along with a list of old growth characteristics. The definition presented — "old growth forests are relatively old and relatively undisturbed" — was generally rejected by participants as being too vague and not useful in the field. Many members of the public did not like the use of the word "relatively". Many were concerned that criteria developed elsewhere, and on which the discussion paper relied, might not be applicable to Ontario's forests. In terms of a definition for old growth many felt that the emphasis should be on the forest ecosystem, not the trees. In general, it appears that the public supports the use of an ecosystem-based definition for old growth forests. At the resource managers and sectoral workshops it was suggested that such a definition for "old growth forest ecosystems" be accompanied by an index or a classification system akin to that used for classifying wetlands in Ontario. It was suggested that such a classification system should account for factors such as size of stand and level of human disturbance. It would be used in long-term planning and should be applicable in the field.

Forest succession was discussed frequently. There were many opinions offered on red and white pine succession and on the role fire plays in pine regeneration. Some argued that red and white pine is self-replacing. Others argued that old growth red and white pine is generally succeeded by other species, and that tomorrow's old growth pine will most often develop from young pine on other sites, especially in the absence of fire.

Many participants thought that a strategy that ensures the existence of old growth in the future must ensure the health and survival of red and white pine in all age classes. Some participants also expressed a concern that regeneration of white pine has been inadequate.

Support was strong for interim protection of all stands of old growth red and white pine, because so little remains. However, it was felt that decisions must be made quickly on which stands should receive continued protection. Participants from the forest industry, and others, argued that a lengthy freeze would be highly damaging to the industry, even if it was later reversed.

Many participants argued that some existing old growth forests should be protected from all human intervention because of their unique ecological, aesthetic and spiritual qualities. There were differing opinions expressed, however, as to the size of land base that should be reserved for these purposes. Many participants also felt that other existing old growth areas could be managed for old growth characteristics and pine succession. This could involve the use of fire and other techniques to increase the amount of pine in all age classes.

One of the questions integral to developing a conservation strategy for old growth forests is that of how large an area would need to be protected to ensure that old growth forest ecosystems exist in the future. Participants repeatedly indicated that if we are to protect old growth forest ecosystems (and not just isolated old trees or stands), then these areas must be large enough to support ecosystem function. An area large enough to support ecosystem function, however, may still suffer from fragmentation and many argued that forested corridors are needed to link old growth areas.

The Policy Advisory Committee's mandate includes exploring the many values associated with old growth forests. Based on public input, the four most important types of forest values are:

- ecological values;
- aesthetic, emotional, philosophical and spiritual values;
- wilderness and natural heritage values; and
- economic values.

Participants considered the ecological values of old growth forests to be most important. The primacy of ecological values reflects the view of most participants that without healthy

ecosystems it is not possible to sustain either ecosystems or development. In the analysis of public input, ecological values were defined to include biodiversity, wildlife habitat, and the importance of old growth forests as unique systems. The high placing of economic values reflects the concern, generally accepted among participants, about the long-term economic health of northern communities.

Concerns about the economic impacts of strategies that would protect old growth red and white pine ecosystems came for the most part from those who depend on the forest industry for their livelihood. Such people spoke of the amount of timber already set aside for protection in parks, Areas of Natural and Scientific Interest, and elsewhere. Participants spoke of the need for fairness, and for compensation to communities where old growth red and white pine was removed from production. They spoke of the need to balance jobs and the environment, especially in communities where there was a great deal of dependence on red and white pine. Counter to this was the demand expressed by many that there was a need, not for balance, but to redress the imbalance which had existed for 200 years — the imbalance of short term economic interests being held above all else. While some spoke of developing alternate sources of employment, particularly tourism, others doubted that tourism or other alternatives could ever replace logging as a major contributor to employment and provincial wealth.

In general, the prevailing view expressed was that economic and regional concerns must be addressed, but within a larger, long term vision of ecosystem health for Ontario's forests.

One often-stated public concern related to the need for better information on which to base decision-making. Many of those consulted believed that they could not make an informed recommendation on management options for red and white pine in the absence of information such as:

- the potential social, ecological and economic implications of various possible strategies, including dollar costs where feasible and appropriate;
- the location and size of existing old growth red and white pine stands, both in protected areas and in areas available for harvest; and
- succession processes and the status of pine regeneration.³

Also of concern to members of the public was the need for improved management techniques. Many participants believed that "new forestry" had great potential for retaining old growth characteristics and many of the values associated with old growth forests.

³ Significantly more information is now available on pine inventories than was available at the time the consultation was carried out. PAC has made recommendations on research to address items one and three.

Participants identified a number of institutional challenges to the effective development of a conservation strategy for old growth forests. These included: the question of how to deal with valuable old growth on private land; the need to address cross-jurisdictional issues involving OMNR and other governments and agencies; the need to achieve a measure of local control over forest resources; and the difficulties of implementing old growth forest policies. On this last point, participants raised concerns about staff and budget resources, the need for public support and understanding, and the need for policies which can be consistently implemented in the field.

OLD GROWTH RED AND WHITE PINE IN ONTARIO

Ecology

Ontario's forests have been changing for thousands of years. Starting about 12,000 years ago, temperatures warmed and the last great glaciers retreated from Ontario. In the wake of the glaciers, plant communities were established and spread north. Using the fossil record, the sequence and timing of changes in vegetation have been determined. The record indicates that the earliest boreal forest was dominated by white spruce. In the period from 7,000 to 3,000 years ago when temperatures were an average of one to two degrees warmer than today, this white spruce forest moved northward. Species such as red and white pine, hemlock and beech also migrated far into northern Ontario. In the last 3,000 years average temperatures cooled and Ontario's tree species retreated southward to form the current Boreal, Great Lakes-St. Lawrence and Deciduous Forest Regions (see Figure 1). White pine reached its northernmost extent almost 4,000 years ago; since then its range has shrunk significantly as average temperatures dropped. Changes will continue to occur. With global warming, climate zones may shift several hundred kilometres north over the next 50 years. Migration of tree species northward would lag behind these climatic shifts.

It is difficult to determine how much red and white pine covered the landscape before European settlers arrived. According to Morse (1984), "when the first settlers arrived, they found that in much of the Ontario forest, red and white pine were the dominant trees and that, of the two species, white pine was by far the most prevalent". First viewed as an impediment to farming and travel by land, the "interminable forest" (in the words of Catherine Parr Traill) assumed a vital economic role with the rise of the timber trade from the early 1800s on. During the hundred years of cutting that took place before reforestation began in the early 1900s large tracts of red and white pine forests were destroyed.

Today the range of red and white pine encompasses the Great Lakes-St. Lawrence forest region, (see Figure 1). The northern limit of both species is generally the southern border of the boreal forest, although isolated individuals and scattered stands can be found farther north. Remote sensing studies have been done recently as part of the OMNR's Ontario Forest Research Institute Forest Fragmentation and Biodiversity Project. These studies (Spectranalysis 1992a and 1992b) provide a picture of how much red and white pine remain in northern Ontario. The amount of mixed forest with a red and/or white pine component⁴ is small: 2.46% of the total area of the northeastern part of the species' natural range, and 0.83% of the total area of the northwestern

⁴ The studies identified areas where red and/or white pine had not been burned or cut within the last 50 years, and where red and/or white pine made up more than 10% of the forest.

part of the species' natural range⁵.

The Forest Resources of Ontario 1986 provides figures on the amount of trees by species, age class and volume⁶. Using 1985 figures, the total volume of trees growing in Ontario's production forests was estimated to be 5.1 billion cubic metres. Of that amount only 2% was white pine and 0.4% was red pine. To provide some context, 40% of the provincial growing stock in 1985 was black spruce, 12.8% was jack pine, 19.8% was poplar, 7.5% was hard maple, and 7.2% was white birch.

The most recent inventory information for red and white pine, by age class, is illustrated in Figures 2 and 3. Age classes are divided into 20 year intervals; anything older than 120 years appears in the "121+" group. Figure 2 shows the area in hectares of red and white pine working groups and the land ownership. It is based on summaries of the OMNR Forest Resources Inventory. Figure 3 shows the area in hectares of red and white pine in other working groups where pine makes up 10% or more of the trees. Figure 3 includes only Crown lands and is based on information prepared by staff in OMNR district offices. PAC recognizes the difference in various inventory numbers and has addressed the issue of inventory in its recommendations.

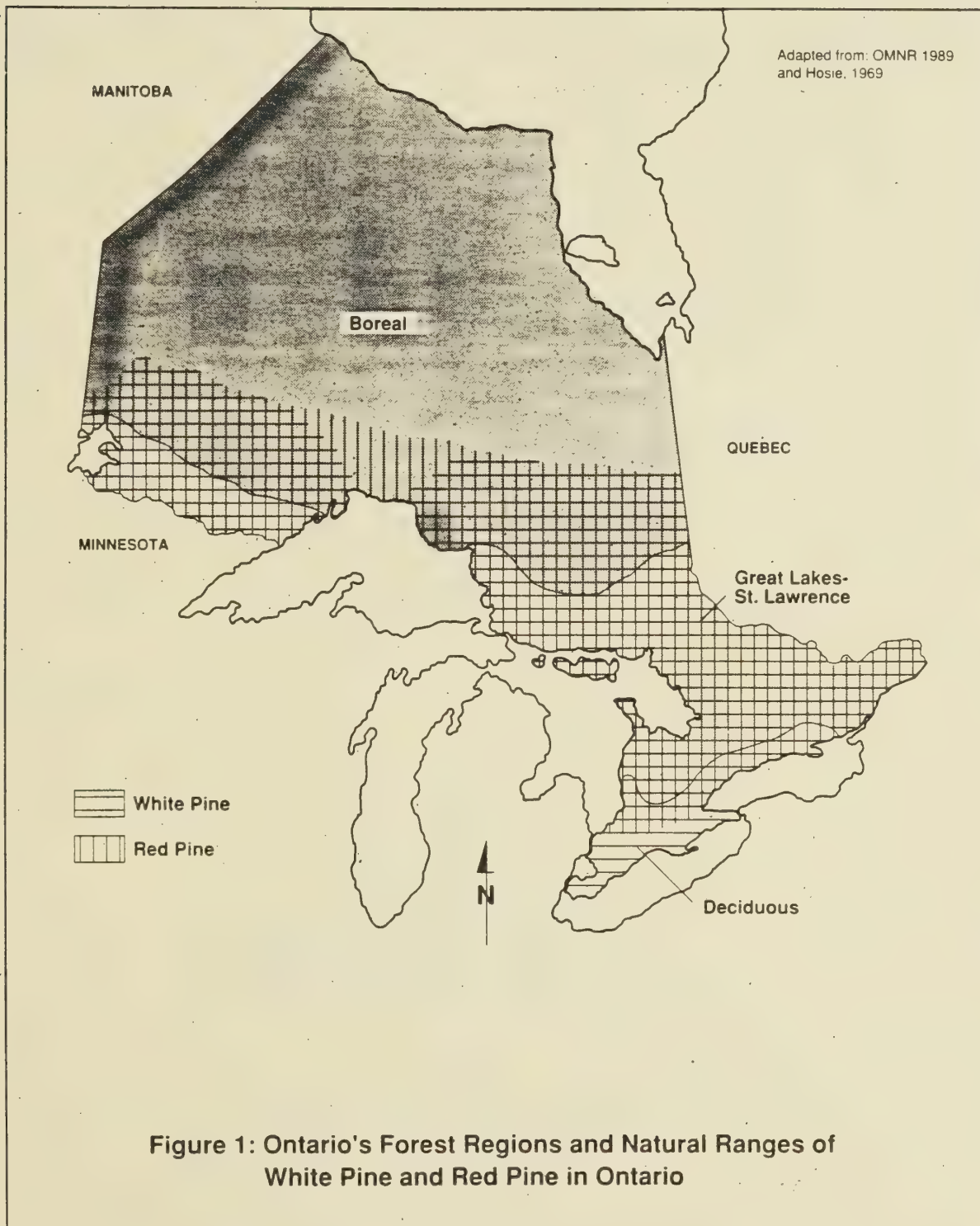
In their natural state concentrated stands of red or white pine are rare. Although some of these stands of white pine can be found in the Central and Northwest Regions (see Figure 4), generally red and white pine are found in mixedwood stands with 30 to 60 percent hardwoods. Commonly associated species include jack pine and red oak on dry sites, and balsam fir, white spruce and tolerant hardwoods on moister sites (OMNR, 1989).

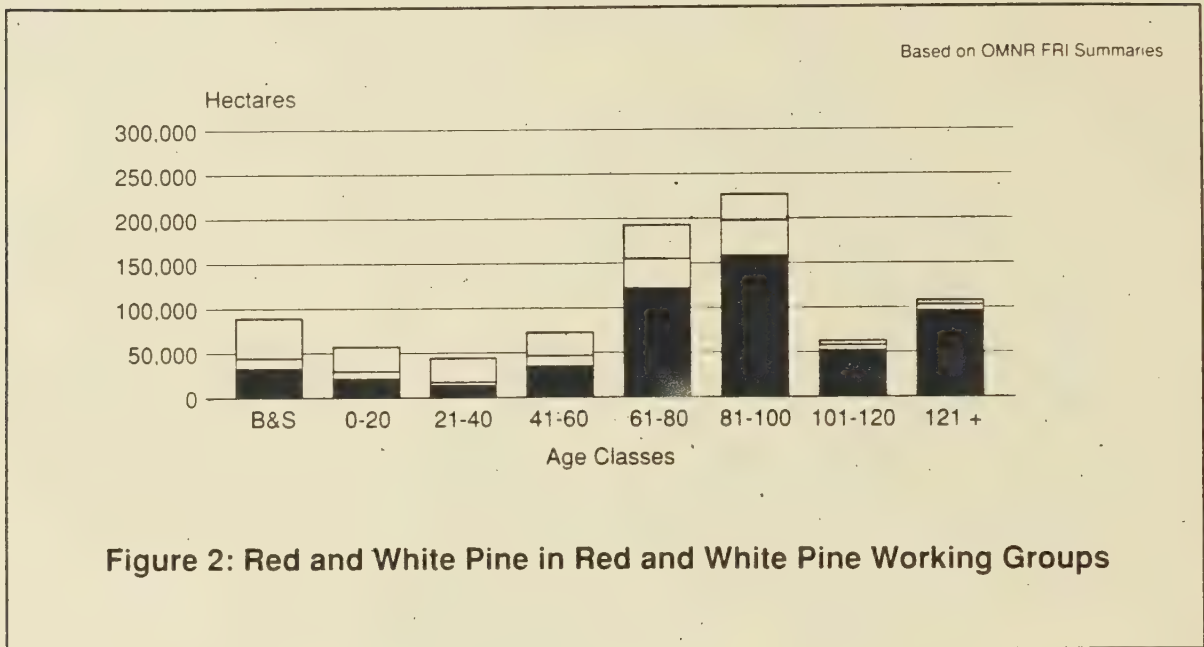
For red pine, average height at maturity is about 25 metres, with maximum heights of up to 46 metres. Considered mature at about 150 years (depending on site conditions), red pine can grow to 350 years of age (Mosseler, 1992). Red pine grows best on deep, well drained, fine sands and loams. It is considered very sensitive to competition from other plants, and being relatively intolerant of shade, requires full sunlight for optimal seedling growth (OMNR, 1989).

The white pine is the tallest conifer in eastern Canada: mature white pines will commonly reach heights of 30 metres, and can grow to 50 metres in favourable soils (Morse, 1989). White pine is considered mature at about 200 years (depending on the site conditions) and can grow to 500 years of age (Stearns, 1992). The species grows best on fine sands, sandy loams, loams and silt loams and can tolerate a wider range of soil moisture conditions than can red pine. White pine regenerates best in the partial shade of other trees, (OMNR, 1989).

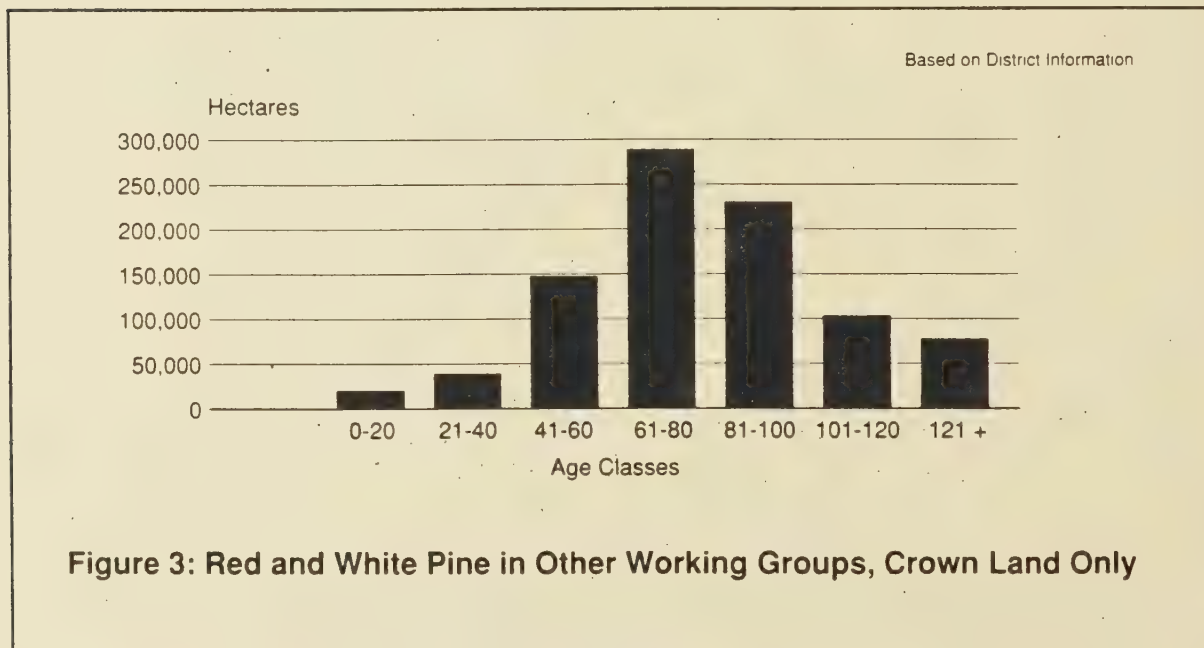
⁵ A third study is underway to determine the amount of red and white pine remaining in the Algonquin Region. This will complete the remote sensing of the entire range of Ontario's naturally-occurring red and white pine.

⁶ Volume is calculated as a function of age, height and stocking level (amount of tree cover in an area).





Crown
 Provincial Parks
 Patent



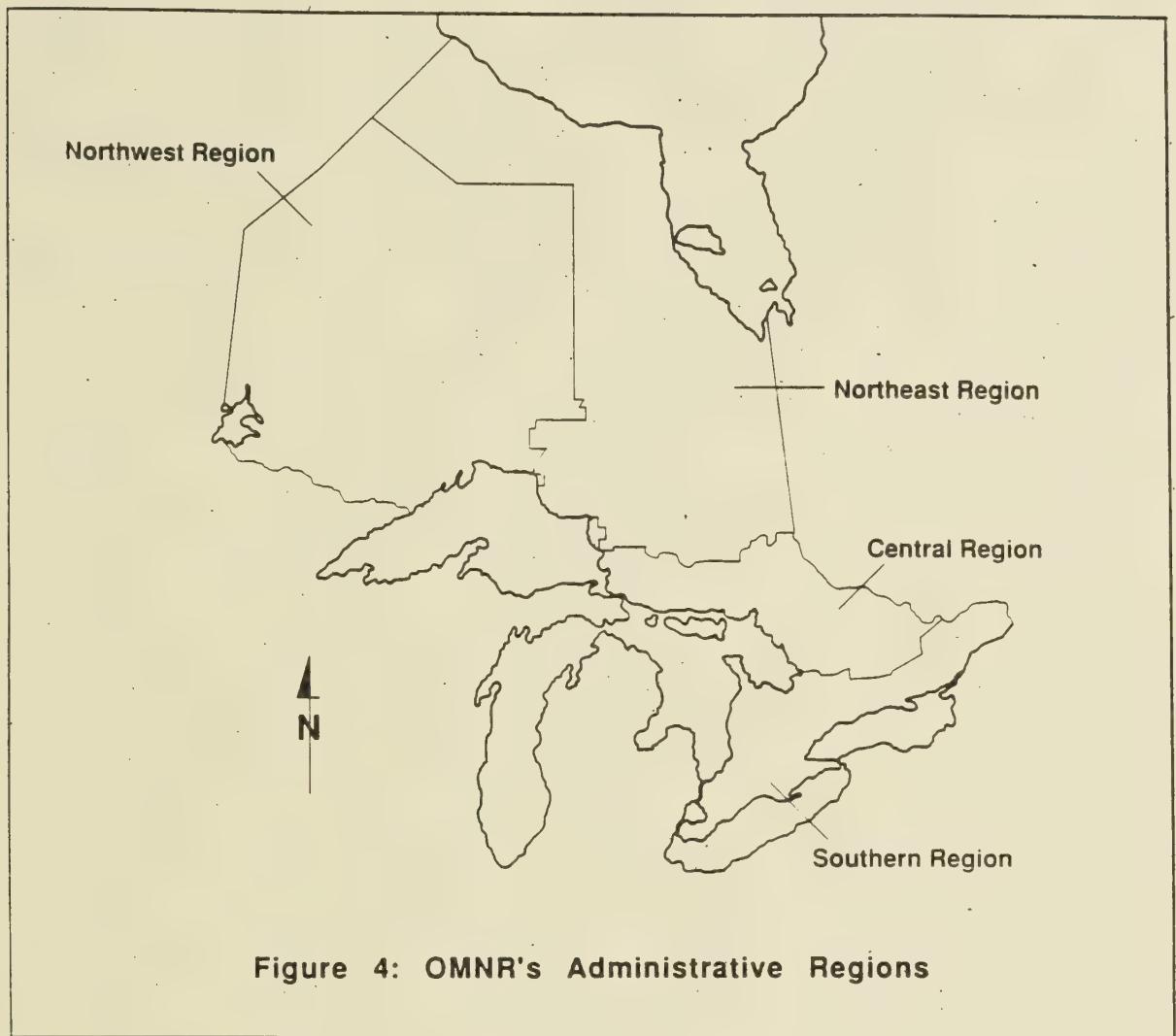


Figure 4: OMNR's Administrative Regions

Succession of red and white pine forests is not well understood. The structural variability found in old growth stands (Carleton and Gordon, 1992) suggests that there are multiple pathways leading to this phase. Many factors influence succession including forest composition, forest floor conditions, soil conditions, fire frequency and fire intensity (Struik, 1990; Steill, 1978; Van Wagner, 1971; Quinby, 1988, 1991). Forest succession may also be affected by insects such as the white pine weevil, diseases such as white pine blister rust, and browsing by deer (Horton and Bedell, 1960).

Most of the great pine forests in Ontario were established after extensive ground fires (Stiell, 1978). On many sites fire creates a receptive seed bed and reduces competition from other vegetation (Maissurow, 1935, 1941). Red and white pine are well adapted to surface fires of light to moderate intensity. During such fires their thick bark provides protection and their height prevents their crowns from burning. Prior to fire suppression red and white pine were favoured by surface fires occurring at intervals of 20 to 40 years combined with more intense fires on a 150 to 200 year cycle that would kill most trees (Cwynar, 1977). In some areas of the red and white pine range the fire cycle prior to fire suppression was 105 years. Since fire suppression the cycle has lengthened dramatically and the size of burns has been greatly reduced. Without fire, pine forests may be replaced by shade tolerant species such as balsam fir, cedar, red maple, white birch and mountain maple (Day and Carter, 1991).

The genetic variation in red pine is very low (Fowler and Morris, 1977). This species is uniform in structure and apparently very old. In contrast, white pine is quite variable genetically (Abubaker and Zsufa, 1990). Its appearance varies greatly in different parts of its range, suggesting the existence of as yet unidentified ecological or geographic races (Heimbürger and Holst, 1955). With forest fragmentation increasingly isolated stands of white pine may suffer from a loss of genetic variability due to the inability of genetic material to flow freely through the population.

Although trees are the dominant life form in a forest, there are thousands of other plants and animals in the ecosystem. Recent studies of old growth red and white pine conducted by Carleton and Gordon (1992) show a rich association of plants with an understory containing from 35 to 75 species of plants. Invertebrates, mosses, lichens, fungi and other plants and animals are an important part of the forest, adding to the complexity of the food web, and the diversity of the ecosystem. Many forms of wildlife are associated with red and white pine forest ecosystems. These include large mammals (deer, moose and black bear), small furbearers (marten, fisher, lynx and others), many species of raptors and perching birds, amphibians, and invertebrates. It is not yet known how dependent these animals may be on old growth red and white pine forests.

Management

Current management practices for pine are laid out in OMNR's *Silvicultural Guide for the White Pine and Red Pine Working Groups in Ontario*. Decisions about cutting, harvesting, regeneration and maintenance are made by taking into account site factors such as soil type, topography and microclimate, along with economic, wildlife and environmental considerations.

OMNR's current guidelines recommend the use of shelterwood and clearcut systems for white pine and clearcutting for red. The shelterwood system removes an entire stand by using a series of partial cuts over time. The trees left standing provide a seed source and shelter for regeneration. In clearcutting the entire stand is harvested in one operation, with or without leaving seed trees. Harvesting in any of these ways requires the building of roads to the cutting area and the use of skid trails for moving harvested trees to loading areas.

Regeneration after cutting can involve site preparation to create suitable conditions for seeding or planting. Site preparation is done for four reasons: to suppress competing vegetation; to mix up soil and organic material; to reduce, remove or re-align slash (the tops and branches of trees left behind after harvest); and to give better control over the spacing of trees. Site preparation for red and white pine can involve mechanical means, herbicides, or prescribed burning, used alone or in combination. On some dry, sandy sites, natural regeneration of white pine can occur where shelterwood cutting has taken place. On wetter sites, planting is preferred for white pine. For red pine, planting is the only recommended method of regeneration because of its shade intolerance and its irregular and infrequent seed crops.

For red and white pine OMNR's currently recommended maintenance includes cleaning, thinning, stand improvement and pruning. Cleaning is the removal of competing plants by chemical, mechanical or manual means. Thinning is the removal of some pines in order to increase the growth of others. It can be done selectively — by removing weaker trees — or by row in a pine plantation, or in combination, and is often done more than once. Improvement cutting in a mixedwood stand involves the removal of defective or overmature trees of other species in order to favour the growth of pines. Pruning involves the clipping and destruction of terminals that have been damaged by white pine weevil.

Pests that damage red and white pine include insects (white pine weevil, redheaded pine sawfly and European pine sawfly); diseases (white pine blister rust, scleroderris canker, fomes root rot and red ring rot); and mammals such as mice and deer. Pest management is integrated into harvesting, renewal and tending operations.

There is growing public concern about the potential environmental effects associated with the cutting, regeneration and maintenance of red and white pine forests. Inappropriate road construction and harvesting techniques can lead to soil erosion and silting of watercourses. The

inappropriate use of clear cutting can adversely affect wildlife and waterbodies, as can the use of herbicides. As described earlier, the public is also concerned about reduction in biodiversity caused by traditional silvicultural methods and the cutting of old growth forests.

Partly in response to these public concerns, there is an increased emphasis being placed on what has been dubbed "new forestry". New forestry originated in the US Pacific Northwest, and seeks to better integrate concerns about biodiversity and ecology with those of timber management. Some of its objectives are similar to those of the OMNR's Sustainable Forestry Initiative. New forestry looks at the forest ecosystem and aims for a sustainable forest, not a sustainable yield of timber. Central to new forestry is management using an ecosystem approach. Some of the ideas put forward by advocates of new forestry relate to enhancing the diversity of managed stands, promoting old growth characteristics, minimizing forest fragmentation, and providing habitat reserves and wildlife corridors (BC Ministry of Forests, 1991).

Social, Cultural and Economic Aspects

The growth and development of Ontario has to a great extent been built on its pine forests. According to Morse (1984):

"At one time, Ontario's white pine accounted for nearly forty per cent of Canada's exports. For most of the nineteenth century, through the sale of timber berths and the collection of timber dues, the white pine brought in millions of dollars to the provincial treasury, nearly thirty percent of all revenue collected. In fact, this was the largest single source of income for the province until the early 1900s, and to a large degree it provided the funds for the building of schools and roads and for the other necessary functions of the Government of Ontario."

Ontario's first forestry "boom" began in 1810, with the initiation of the square timber trade. Red and white pine were harvested in the Ottawa Valley first by independent operators, and later by the first timber barons for shipment to England to supply masts and spars for the Royal Navy. New markets in the US for Ontario's lumber opened up in the 1850s as demand for construction materials boomed. The signing of the Reciprocity Treaty of 1854 allowed sawn timber to enter the US duty-free; as a result, new and more advanced sawmills sprung up around the province. Technological advancements allowed for additional exploitation of forest resources. The specifications for sawtimber were less stringent than for the square timber trade and many areas were harvested more than once. Cutting went on at a furious pace, and harvesting peaked in the late 1800s. When the supply of pine in the Ottawa Valley began to dwindle the timber barons built railways to link up mills with pine forests. By the end of the nineteenth century a network of privately-built rail lines criss-crossed the province, providing access to the pine forests of Georgian Bay and the Algonquin Region.

According to Morse (1984):

"In the middle of the nineteenth century, it was estimated that there was sufficient pine to feed the mills for the next six hundred years. Seventy-five years later, most of the great pine forests that had covered Ontario were gone. Sawmill production dropped and mills closed."

As far back as 1871 there were far-sighted observers who realized that Ontario's timber supply was not, as so many believed, inexhaustible. In that year, Sir John A. Macdonald wrote to Sandfield Macdonald, the Premier of Ontario, to express his fear that "we are recklessly destroying the timber of Canada and there is scarcely any possibility of replacing it". The Prime Minister urged the creation of a joint commission to look into regulating cutting, the possibility of replanting, and how forests could be protected from fire. But little changed and the cutting continued for many years unabated. According to Day (1990), "in a last ditch attempt to save some forest, the government of Ontario established Algonquin Park in 1893, *after* most of the merchantable wood had been cut, and Quetico Park in 1913."

Day also tells us that a number of spectacular fires in the years 1845 to 1871 caused great public concern due to the loss of human lives and timber. In response to this concern the first forest fire protection legislation was passed. It was not enforced until 1885, and then ineffectively. Two great fires in Northeastern Ontario — one in 1911 in which 70 people died and 181 km² of forest was burned, and another in 1916 when 250 people died and 3,110 km² burned — led to the more comprehensive Forest Fires Prevention Act. This strengthened act, which was passed in 1917, marked the beginning of effective forest fire suppression in Ontario.

Fire suppression inhibited pine regeneration; this, coupled with the extensive harvesting of the nineteenth century, resulted in a dramatic loss of pine on the landscape. External factors such as the Depression also contributed to a decline in the annual pine harvest and production hit an extreme low in the years 1930 to 1935 (Aird, 1985). Beginning in the 1950s the use of mechanized logging techniques increased. Mechanized logging increased the area that was available for harvesting — forest stands that were once too difficult to cut by hand could be accessed by skidders and bulldozers.

For the last 60 years the harvest of red and white pine has remained relatively stable at approximately 800,000 m³ annually. Demand for the wood remains high and the primary market for sawtimber has been less affected by cyclical economic forces than has pulp and paper. The characteristics of white pine — its fine grain, durability and stability — make it suitable for a wide range of construction applications. Because of its strength red pine continues to be in demand for applications such as utility poles where greater mechanical strength is needed (OMNR, 1989).

From 1982 to 1986 white pine and red pine accounted for 44% of the softwood lumber sawn in those mills that processed these species. However, for some mills, red and white pine was the prime source of material. Production was concentrated in the Central Region, with 84% of red and white pine lumber coming from this region (*ibid*).

North American demand for Ontario's dominant forest products — softwood lumber and newsprint — is not expected to experience strong growth in the coming decades. Ontario's softwood sawtimber has been harvested above sustainable levels in the past and will have to be reduced in the coming decades to incorporate sustainable practices (Resource Information Systems Inc. and Resource Economics Inc., 1992).

The Old Growth Policy Advisory Committee uses a broad definition of "economic value", recognizing that the economic value of old growth red and white pine forests goes far beyond the value of timber they contain. Red and white pine ecosystems also provide economic value through activities such as trapping, tourism, hunting and gathering. There is increasing recognition of the value associated with activities such as canoe tripping, hiking, and camping. However, at the present time, quantifying the economic value of "outputs" other than timber is not easy, and there is no agreed-upon method of evaluating them. Through the Forest Values Project, OMNR is exploring ways to measure the value of both industrial and non-industrial uses of forests.

RECOMMENDATIONS

Introduction

The Policy Advisory Committee has developed a definition for old growth forests based on the input received from the public and the advice of the Scientific Advisory Committee:

"Old growth forests are ecosystems characterized by the presence of old trees with their associated plants, animals and ecological processes. They are reflective of the pre-settlement forest."

By "pre-settlement forest" the Committee means the forest that was present prior to European settlement. The Committee acknowledges that there was a human presence in and use of forests before European settlers arrived, but believes that the most significant impacts made on the province's forests have been caused by the extensive agricultural, industrial and extractive uses that have characterized the era of European settlement. The term "pre-settlement" has been used by the Committee to describe forests which are largely unchanged by humans. Many people link the notion of old growth (especially old growth red and white pine) to such a forest, and they use many terms to describe the state — "natural forest" or "wild forest" being two that are frequently used.

In order to be useful in the field PAC's definition of old growth forest ecosystems must be supported by an index. This would be used to classify old growth forests and would be applied regionally and locally by resource managers. This is addressed in the recommendations on Research.

The Policy Advisory Committee recognizes the need for a multi-faceted old growth conservation strategy which includes the following components:

- Inventory and Information;
- Research;
- Protection;
- Forest Management Practices; and
- Restoration.

Better inventory and information tools are needed to make more informed decisions on red and white pine management. Further research on red and white pine forests will help fill important data gaps. Protection of some portion of old growth red and white pine is needed to keep what little old growth remains, to minimize human disturbance and provide areas of "natural forest". Changes in some forest management practices are required to harvest stands in a way that can retain old growth characteristics and the presence of pine on the landscape. Restoration of pine

on the landscape will increase the amount of pine growing and will help ensure that red and white pine forests will exist in the future, over the long term.

A rationale is provided for each section of recommendations. The rationale, and the recommendations themselves, are based on what the Committee heard from the public and the interests and expertise of members of the Committee. The Scientific Advisory Committee provided input and review for the recommendations on inventory and information, research, and protection.

In developing the recommendations PAC considered the following:

- Most people consulted showed a strong interest in retaining "natural forests" and ensuring that red and white pine remains on the landscape. There is a widespread recognition that to ensure the existence of old growth red and white pine forests into the future, we must encourage the renewal of these species and encourage the presence of all age classes across the landscape.
- The old growth conservation strategy should be integrated with and complement other resource management initiatives, policy activities and practices that are being developed or that are being implemented.
- The recommendations must be scientifically supportable.
- The time required to implement the recommendations will vary — some recommendations can be initiated relatively quickly, others can only be implemented over the long term. OMNR will develop an action plan in response to the recommendations which will include a timetable for implementation.

Recommendations

1. Inventory and Information

The public expressed a strong interest in having more information available on red and white pine, both for themselves and to guide the Policy Advisory Committee's decision-making. This interest in more information was particularly related to the extent and location of red and white pine old growth forests. Although some of the data gaps identified by the public have subsequently been filled, there is still a need to improve inventories to guide decision-making at all levels. PAC believes that existing information could be used more efficiently, and that information should be more available to the public.

Effective natural resources policy development and decision-making are based on solid information — on data collected, analyzed and verified. Inventories should be taken in a manner that is consistent across the province, yet which meets local and field needs. Field staff should be able to collect information about old growth structural features at the stand level and store them in a data base. This will allow them to classify stands and identify stands with particular features when preparing resource management plans. It will also allow for the managing of old growth forests at the landscape level - that is, management using aggregated, compatible information obtained from across the province.

The Committee recognizes the value of OMNR's "Integrated Natural Resources Inventory System" and believes that the following recommendations will support and complement work done to-date and plans for the future.

- 1.1 *An integrated information system should be developed that is compatible with existing resource data bases, such as the Forest Resources Inventory and the Ecological Land Classification/Forest Ecosystem Classification systems, and which:*
 - a) *incorporates completed Ecological Land Classification/Forest Ecosystem Classification systems for all regions of the Province;*
 - b) *is compatible with a Geographic Information System and is functional at a field level;*
 - c) *is flexible enough to accommodate additional resource information that could be collected at the field level or by other agencies; and*
 - d) *incorporates a completed, digitized Forest Resources Inventory.*
- 1.2 *In each District of the province, maps should be prepared for all Management Units using the current Forest Resources Inventory that will:*
 - a) *identify red and white pine stands that are 121 years and older⁷, and*
 - b) *identify which of these areas do not have road access.*
- 1.3 *Field staff at the district and regional levels should be trained to take full advantage of an integrated information system. Training should focus on using existing technology and providing opportunities for staff to participate in developing new data collection techniques that will allow the incorporation of local information into resource data bases.*

⁷ 121 years is the oldest aggregation available from the Forest Resources Inventory.

2. Research Needs

Research will improve the understanding of old growth forest ecosystems. It will also assist resource managers in implementing the old growth conservation strategy, improving management decisions and practices when dealing with old growth systems, and understanding the impacts of decisions. Research recommendations have been divided into four categories: Old Growth Indices, Ecology, Management, and Socio-economic.

OLD GROWTH INDICES

An old growth index will provide a tool for identifying and comparing potential old growth sites. In making decisions about protecting old growth red and white pine areas the index can be used to assess the quality of stands identified as old growth sites. It can also be used to identify stands in which specific management techniques could be used. A model index would be developed provincially; regional and district staff would apply the model in developing indices for their specific forest conditions.

2.1 *Old growth indices for red and white pine should be developed for use at the site region/site district level. The index should include such factors as:*

- *age;*
- *minimum area;*
- *site conditions;*
- *tree species composition;*
- *tree density (number of stems per hectare);*
- *level of human disturbance;*
- *species diversity;*
- *spatial configuration (the favouring of sites that reduce forest fragmentation and build on contiguous areas or provide for corridors);*
- *the presence of rare, threatened, or endangered species; and*
- *structural diversity.*

ECOLOGICAL RESEARCH

Ecological research is required to gain a better understanding of the role of disturbance in red and white pine ecosystems and their associated successional pathways. It will also provide an insight into how old growth forests differ from other forests in terms of diversity, structure, function, and importance as habitat. Determining the age class distribution for red and white pine in the pre-settlement forest may give an indication of the amount of old growth that should be present on the landscape, and may thus assist in providing targets for restoration efforts.

- 2.2 *The disturbance sensitivity (or resilience) of old growth red and white pine ecosystems should be determined in order to understand how much disturbance can occur in an old growth forest and have it still qualify as an old growth forest ecosystem.*
- 2.3 *The nature of red and white pine regeneration and successional pathways should be more precisely determined (see Recommendation 2.10). This should include determining if exposed mineral soil is necessary for the regeneration of red and white pine. The effect of fire suppression on old growth red and white pine forest ecosystems over the long term should be determined.*
- 2.4 *It should be determined which plants and animals are dependent on old growth red and white pine forest ecosystems and for what parts of their life cycle.*
- 2.5 *A determination should be made of the levels of diversity occurring within relatively undisturbed red and white pine forest ecosystems, including structural, habitat, species and genetic diversity. The impacts of forest fragmentation on these variables should also be determined.*
- 2.6 *Forest inventory information for the pre-European settlement era should be assembled. This will allow comparisons to be made with current forest inventories, and will help determine restoration targets.*

MANAGEMENT RESEARCH

Research into management practices may yield management techniques that will retain and enhance old growth characteristics. So-called "new forestry" techniques that focus on sustaining biological diversity and maintaining ecosystem health may have applicability to Ontario's forests.

- 2.7 *The minimum forest size required to maintain ecosystem function should be determined in order to assist in the evaluation and designation of protected areas.*
- 2.8 *Investigations should take place into the applicability of forest management practices that sustain biodiversity, maintain long term ecosystem health and old growth characteristics. These studies should:*
 - a) *focus on applications that can be implemented; and*
 - b) *develop and evaluate silvicultural techniques for providing old growth characteristics.*
- 2.9 *A field technique should be developed to determine the extent of heart rot in old red and white pine trees, so that only marketable trees are harvested and others can be retained as important components of the forest.*
- 2.10 *Ecosystem function in old growth areas that are relatively undisturbed should be monitored and evaluated against ecosystem function in areas that are being harvested, for comparative purposes. Case study areas should be selected for monitoring over the long term.*

SOCIO-ECONOMIC RESEARCH

Socio-economic research is required to provide assistance in decision-making and assessing the consequences of decisions. A model for assessing socio-economic impacts should be developed which can be applied to a wide range of values — recreational, ecological, biological, cultural and economic. This would allow assessment of a broad range of socio-economic impacts including impacts on local employment, aboriginal communities, and archaeological sites.

- 2.11 *A methodology should be developed for quantifying all values of old growth forests in economic and non-economic terms.*
- 2.12 *A model should be developed that can be used as a decision-making tool to weigh the socio-economic impacts of resource management decisions. The model should be tested in a number of case studies.*

3. Protection

Most people consulted felt that protection was an important and necessary component of an old growth conservation strategy. Only small areas of old growth red and white pine forest remain in Ontario; outside the province, it is rarer still (Quniby, 1991a). Only in protected areas can many of the values associated with old growth forest ecosystems be maintained. Areas that are protected against major human disturbance will also provide a benchmark against which to compare the functioning of managed areas.

In devising the protection component of the conservation strategy for old growth red and white pine, PAC has addressed three fundamental issues. These are:

- how criteria to select areas for protection should be developed;
- how large individual protected areas should be; and
- where protected areas should be located.

The various protection initiatives within the OMNR should be integrated. PAC accepts the OMNR approach to representation by site district, subject to the modifications described below.

- 3.1 *Old growth red and white pine areas should be given priority when establishing new protected areas as a part of the network of ecologically representative areas. This should be done through the Natural Heritage Areas Strategy⁸. Representation should be based on site districts.*
- 3.2 *The criteria for life science representation used by the OMNR to assess if areas should be included in the network of ecologically represented areas noted above should be amended to specifically include old growth red and white pine ecosystems as worthy of protection. Integrity measures should be added to the life science criteria. Specifically, area requirements for life science representation should provide for the spatial requirements of species inhabiting the forest, maintenance of ecological processes, gene pool conservation, ecological representation, uniqueness, and representation of all forest age classes.*
- 3.3 *Old growth red and white pine areas that are assigned for protection should be designated under legislation, such as an Ecological Reserves Act or an amended Parks Act.*

⁸ This is part of the Endangered Species Challenge by the World Wildlife Fund, Canada.

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- 3.4 *Existing provincial and federal parks should be evaluated for their contribution to ecological representation by site district. Conservation Authority and other public lands under a protection regime should also be evaluated. In the short term, zoning should be used to protect old growth areas within provincial parks from human disturbance; over the long term, they should be protected under legislation as noted in recommendation 3.3.*

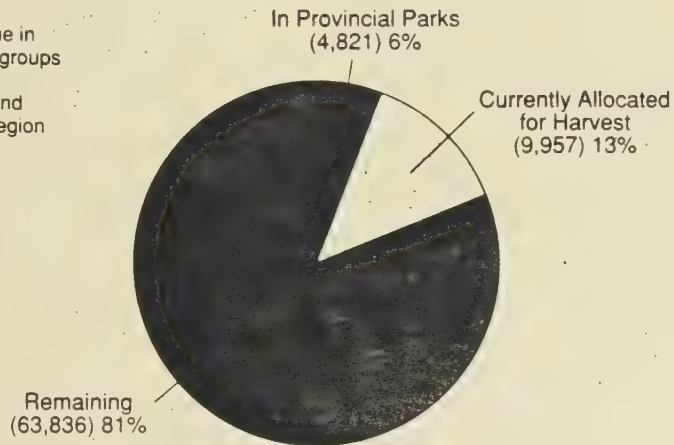
Ontario's old growth red and white pine forests are disappearing at a rapid rate. Figure 5 illustrates how much red and white pine over 121 years in red and white pine working groups on all Crown lands is allocated for cutting in current five year timber management plans. Of the total remaining in each Region, 19% is allocated for cutting in the Northeastern Region, 15% in the Northwestern Region, and 13% in the Central Region. PAC recognizes that management plans for this allocated pine are in place or are currently being prepared and that the harvesting could eliminate some of the last remaining old growth forest ecosystems. The recommendations below address how old growth red and white pine areas should be selected for ecological representation.

- 3.5 *The old growth red and white pine areas identified in the 1991 reconnaissance survey in Site Region 4E ("the Iles Report") should be evaluated for their contribution to site district representation. This should be a priority in the Natural Heritage Areas Strategy and should be completed by the end of 1993. Until this is done, cutting of those old growth red and white pine sites should continue to be deferred.*
- 3.6 *For the red and white pine range outside Site Region 4E, reconnaissance surveys should be undertaken to identify old growth red and white pine areas that meet regionally established size, composition and disturbance criteria. Because of the potential loss of old growth areas, immediate action is required for this recommendation (i.e. within three months of this report's release). After the survey is completed, cutting of red and white pine in the identified candidate sites should be deferred until evaluation of site district representation has been carried out (see 3.7).*
- 3.7 *Outside of Site Region 4E, areas of old growth red and white pine that have been identified in reconnaissance surveys should be evaluated for their contribution to site district representation. This work should concentrate first on the northwestern region, and should be completed by the end of 1994.*

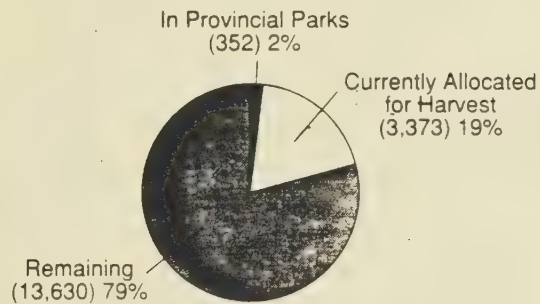
*Refers to red and white pine in red and white pine working groups

**There is not enough red and white pine in the southern region to chart at this scale

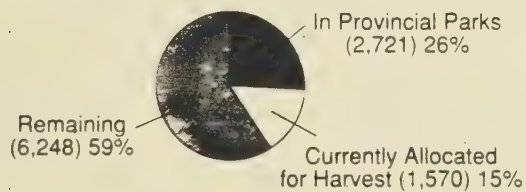
Based on OMNR
FRI Summaries and
District Information



Central Region



Northeast Region



Northwest Region

**Figure 5: Red and White Pine Aged 121+ Years on Crown Land
Allocated for Harvesting (in Hectares)* ****

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- 3.8 *When old growth red and white pine areas are evaluated for ecological representation, social impacts should be assessed using the model outlined in 2.12. If, when evaluating areas for site district representation, there is a choice of areas that would satisfy the amended OMNR life science representation criteria, a socio-economic impact filter should be applied as a second level determinant (see Recommendation 2.12).*

The public has indicated its concern about the possible negative economic effects of protection strategies on industries and communities. If environmental protection takes precedence over jobs, then workers and communities must be supported by the government and people of Ontario. Such support could include relocation assistance, retraining, counselling, and the enhancement of severance benefits.

- 3.9 *Should the establishment of protected red and white pine areas result in mill closures, the Minister of Natural Resources should initiate discussions with appropriate federal and provincial agencies to explore opportunities and responsibilities for retraining and relocation assistance for workers and the establishment of adjustment committees.*

4. Forest Management Practices

There is considerable public interest in improving management techniques to retain old growth characteristics and many of the values associated with old growth forest ecosystems. The Committee accepts the International Union for the Conservation of Nature definition of conservation which includes both protection and wise utilization of resources. Following from this, and given the high level of concern about loss of red and white pine on the landscape, PAC has considered forest management practices, including harvesting and regeneration, in its strategy to conserve old growth red and white pine.

The presence of red and white pine on the landscape has been greatly diminished since European settlement. For biological, social, cultural and economic reasons this is of great concern to the people of Ontario, including members of SAC and PAC. Site-specific silviculture practices within planned forestry operations will contribute to the regeneration of red and white pine, the maintenance of site productivity, the protection of desirable advanced growth, and the maintenance of biodiversity and water quality.

It was in the Pacific northwest that public concern about old growth and forestry practices in old growth forests first emerged. In response to this concern a so-called "new forestry" approach was developed to manage old growth Douglas fir forests in the western Cascades and coastal areas of Oregon and Washington. New forestry advocates managing forests as whole ecosystems, not just as stands of timber. Its philosophy is that the primary objective of forest management should be sustaining biological diversity and maintaining long-term ecosystem health and that

timber production should be viewed as one by-product of this management. While the forests of Ontario are very different in terms of species, composition and structure, many of the concerns in Ontario are similar to those in the Pacific northwest. It is likely that some of the principles of "new forestry" can be applied to Ontario's forests. OMNR's Sustainable Forestry Initiative is addressing similar concerns.

The Committee understands that modifying conventional harvesting practices will increase wood delivery costs and that harvestable volumes will be reduced. Generally, more intensive pre-harvest planning is needed than is often done at present. More inventory work and more on-site work such as silvicultural marking, cut layout and control is required to ensure that site-specific silviculture is implemented. For improved harvesting operations forest workers will need training to be able to identify and retain important stand structural components. At present labour laws do not permit the retention of snags (standing dead trees) during harvesting because of the risk to workers' safety. Techniques must be developed that will allow the retention of these important forest features while respecting safety considerations. The successful application of the Old Growth PAC's recommendations will require that forestry workers understand the rationale behind them, are skilled in the necessary management techniques, and can execute them with safety and confidence.

- 4.1 *Some red and white pine trees should be retained in all harvested areas as seed sources, and as a genetic reservoir. The minimum spacing of these trees should be determined by forest geneticists and resource managers. This recommendation applies to all forest stands that contain white and/or red pine.*
- 4.2 *Old growth stand and structural characteristics should be retained in harvested areas, for habitat. These may include snags, trees with dead or dying tops and downed logs in various states of decay. In addition, components of each species and age group in multi-layered stands should be left intact on disturbed areas. This recommendation applies to all forest stands that contain white and/or red pine.*
- 4.3 *Prescribed silvicultural techniques that promote the natural regeneration of red and white pine should be the preferred option for all stands containing white and/or red pine. The next preferred option is natural supplemented with artificial regeneration; artificial regeneration is the last choice. Appropriate prescribed silvicultural techniques should be developed before harvest and should reflect site conditions and stand/structural characteristics.*

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- 4.4 *Training programs should be developed, including programs focusing on the application of new technology, for people preparing and implementing resource management plans. These programs should make specific reference to the management of old growth forests, and should be developed and delivered for resource managers and workers in the field.*
 - 4.5 *An audit program should be developed to monitor the on-the-ground delivery of the old growth management recommendations. Such a program should include monitoring for compliance, and re-evaluation of policies, objectives and targets. Consideration should be given to using independent audit teams, as is the case with Forest Management Agreements.*
 - 4.6 *OMNR's "oldest first" harvesting principle should be abandoned. Other OMNR objectives and guidelines that affect the management of old growth forests should be evaluated to determine their appropriateness in retaining old growth characteristics.*

5. Restoration

Red and white pine has diminished on the landscape since European settlement. The public has expressed an interest in having pine communities restored on sites that once supported these forests. In such cases the aim would be to restore forests to a state that reflects the pre-settlement condition. Red and white pine can be reintroduced to sites through artificial regeneration. Existing pine forests may also require rehabilitation, using natural regeneration where possible.

PAC recognizes that restoration may be difficult and that successful restoration efforts will likely require flexibility in the use of silvicultural tools. The Committee recognizes that restoration will be expensive, yet feels that it must be done. Attainable targets for restoration of red and white pine should be established at the management unit level consistent with provincial and regional policy objectives.

- 5.1 *A program should be initiated to increase the levels of red and white pine on the landscape by reintroducing pine onto sites that previously supported these species and by rehabilitating existing pine forests, using natural regeneration where possible.*
- 5.2 *Targets for restoration programs should be established at the management unit level. These should be consistent standards and measures for the assessment of the program's effectiveness.*

NEXT STEPS

The Policy Advisory Committee's mandate for the second phase of its work is to develop a conservation strategy for all types of old growth forest ecosystems. Phase 2 will begin with an evaluation by PAC of the first phase of its work. The Committee will also be following the implementation of the recommendations contained in the Interim Report.

PAC will emphasize a number of areas in its Phase 2 work. The Committee will determine which other forest ecosystems should be included in its final strategy recommendations. As part of this, PAC will be visiting southern hardwood sites, sites on the Niagara Escarpment, and sites in the Boreal forest region, amongst others. Collection of information will continue on species inventories, ecology and socio-economic impacts in order to provide a firm basis for making Phase 2 recommendations. The Policy Advisory Committee will also deal with issues of old growth conservation by land ownership, and managing old growth ecosystems on a landscape basis using modelling techniques. The Committee will continue to develop linkages with other related programs and policy initiatives.

PAC expects that the Scientific Advisory Committee will continue to be involved in Phase 2 and that SAC will be expanded to include members from the social sciences. There will be increased interaction between PAC, the Scientific Advisory Committee and the scientific community. In addition, a network of resource managers from both the public and private sectors is being developed to advise PAC on operational matters.

Public consultation will continue in Phase 2, using mailings, focus groups and general consultations. The Committee will continue to involve those members of the public whose participation began in Phase 1. The Policy Advisory Committee's final report is due at the end of 1993.

CONCLUSIONS

As the Policy Advisory Committee finishes Phase 1 of its work, and launches into Phase 2, we look back on the work accomplished to date. For PAC members, Phase 1 was a tremendous learning experience. Many people from all walks of life shared their knowledge, beliefs and ideas with us. As we travelled across the province to consult with members of the public, we were able to hear, first hand, people's appreciation of and concern about old growth forests, and were able to understand the many different values so strongly held. This report, with its recommendations for the conservation of old growth red and white pine, is the result of the interest, ideas and commitment of hundreds of people from across Ontario, and some from outside the province. As a Committee, we look forward to hearing comments from members of the public on our work to date.

Within the Committee, there are strongly held views, and strongly felt loyalties to different ways of life and different ways of perceiving life. Many of our internal struggles are a function of our differing views of the world and our places within it. In this way, the dialogue within the Committee is a microcosm of the broader debates taking place in society. Our commitment to operate by consensus reflects our belief in the need for fairness and the need to take an approach which considers the social, economic and natural environment aspects of old growth forests. This commitment demands extended discussion and honest reflection.

It is often difficult for decision-makers to operate in time frames that are appropriate for the conservation of old growth forests. Forests do not function in four year terms of office, or even in human lifetimes. Development of an effective conservation strategy for old growth forests will require planning in time frames of hundreds of years — time frames that respect the long life cycle of forests, a "cycle that includes death and decay to give life to the new" (Potts, 1992). Tough decisions, too, must be made in terms of socio-economic impacts of a conservation strategy. How should long-term interests be balanced against short term needs and wants? How can provincial, even global needs be balanced against those that may be more local or regional in nature?

In developing a conservation strategy for old growth forests, the Policy Advisory Committee faces significant challenges. What is undeniable is the need to face these challenges now, while as Ontarians we still have some areas of old growth forests remaining. Whether PAC, and the province of Ontario succeeds will be measured by our children, and our children's children.

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APPENDIX A

OLD GROWTH

POLICY ADVISORY COMMITTEE MEMBERS

Brennain Lloyd, (Chair)

North Bay, Community Organizer with the northeastern environmental coalition, Northwatch

Vivienne Ball

Sault Ste. Marie, Registered Professional Forester and Chief Forester, Lajambe Forests Products

Tim Gray

Toronto, Executive Director of the Wildlands League, Chapter of the Canadian Parks and Wilderness Society

Mary Laronde

Lake Temagami, Stewardship Director for the Teme-Augama Anishnabai

Warren Mazurski

Thunder Bay, Local 39, Communication, Energy and Paperworkers Union

Reverend Monica Moore

Englehart, Englehart Pastoral Charge, United Church

Bill McGuinty

Kirkland Lake, Geologist for Queenston Mining Inc. and President of the Northern Prospectors' Association

Paula Neice

Kars, Senior Consultant in the consulting firm, Ecologistics Ltd.

Fiona White

Port Hope, Science Teacher, Port Hope High School

Dr. David DeYoe (ex-officio)

Chair of the Scientific Advisory Committee

APPENDIX B

OLD GROWTH SCIENTIFIC ADVISORY COMMITTEE MEMBERS

Dr. David DeYoe (Chair)
Manager of Applied Science and Technology, OMNR, Sault Ste. Marie, ON

Dr. Adele Crowder
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Dr. Douglas Larson
University of Guelph, Department of Botany, Guelph, ON

Dr. Paul Maycock
University of Toronto, Department of Botany, Mississauga, ON

Dr. Dennis Parkinson
University of Calgary, Department of Biological Sciences, Calgary, AB

David Peerla
Greenpeace, National Forest Campaign, Vancouver, BC

Dr. Peter Quinby
Executive Director and Research Scientist, Ancient Forest Exploration and Research,
Powassan, ON

Dr. David Schindler
University of Alberta, Department of Zoology, Edmonton, AB

Dr. Jennifer Shay
University of Manitoba, Department of Botany, Winnipeg, MAN

Dr. Daniel Welsh
Canadian Wildlife Service, Environment Canada, Ottawa, ON

APPENDIX C

PRESENTATIONS MADE TO THE OLD GROWTH PAC

Sustainable Forestry Initiatives Program Geoff Munro, Manager of Policy Development and Transfer, OMNR	25/02/92
Policy Development for Old Growth Ecosystems John Cary, Senior Policy Advisor, Forestry, OMNR	25/02/92
Old Growth Issues in Northwestern Ontario Jim Miller, Old Growth Forests Secretariat, OMNR	23/03/92
Concepts and Principles in Landscape Ecology Dr. Aji Perera, Landscape Ecologist, OMNR Peter Uhlig, Forest Ecologist, OMNR	23/03/92
Focus on Old Growth Will Kershaw, Parks Planner, OMNR	23/03/92
Endangered Spaces Initiative Norm Richards, Director, Provincial Parks and Natural Heritage Policy Branch, OMNR Tom Beechey, Conservation Biologist, OMNR	29/04/92
"New Forestry" and Forest Issues in BC Herb Hammond, Forest Ecologist	29/04/92
Government to Government Relations Gord Peters, Ontario Regional Chief; Keith Lewis, North Shore Tribal Council	29/04/92
Social Values of Pine Forests Wolfgang Haider, Centre for Northern Forests Ecosystems Research, Lakehead University	25/05/92
Features of Old Growth Red and White Pine in Temagami Dr. Peter Quinby, Executive Director and Research Scientist, Ancient Forest Exploration and Research, Powassan, ON	25/05/92

Forest Fragmentation and Biodiversity Program Dr. David DeYoe, Manager of Applied Science and Technology, OMNR	22/06/92
Forest and Fire History of Temagami Old Growth Stands Charlie Van Wagner, retired, formerly Fire Research, Forestry Canada	22/06/92
Old Growth in the Ottawa National Forest Jim Jordan, Ottawa National Forest.	20/07/92
Forestry Policy Framework Forestry Policy Panel, Sustainable Forestry Initiative	30/08/92
Forest Values Project Laurie Gravelines, Forest Economist, OMNR	08/12/92
Ethics in Resource Management Roger Hutchinson, Professor of Ethics, Emmanuel College, University of Toronto	08/12/92
Endangered Spaces Initiative Bob Davidson, Coordinator of Endangered Spaces Initiative, OMNR	14/12/92

SITE VISITS

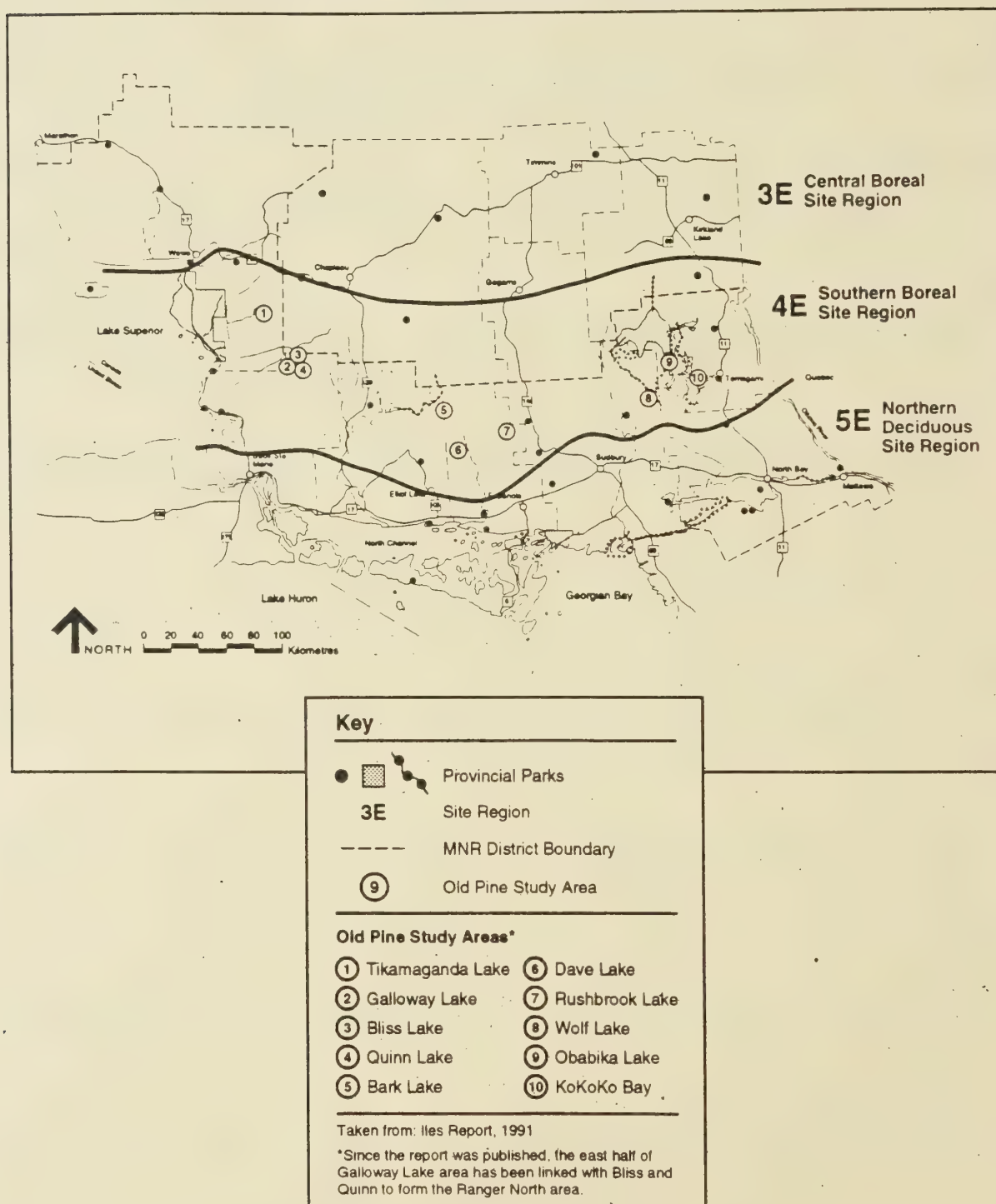
Atikokan (Sapawe Crown Management Unit)	13/05/92
Temagami (Obabika Lake, Temagami Island)	22/06/92
Sault Ste. Marie (Galloway Lake Area, Lajambe Forests Products)	21/07/92
Thunder Bay (Greenwood Lake Area)	01/09/92

APPENDIX D

PROGRAMS INCLUDED IN OMNR'S SUSTAINABLE FORESTRY INITIATIVE

- 1) **Comprehensive Forest Policy Framework**
Sets out long-term objectives for sustaining Ontario's forests and provides a framework for developing detailed forest policies and practices.
- 2) **Silviculture**
Research and Development Projects and Applied Ecology Projects that will increase the information available for managing the whole forest in a sustainable manner.
- 3) **Old Growth Conservation**
A public Policy Advisory Committee and a Scientific Advisory Committee charged with making recommendations by the end of 1993 on an old growth forest ecosystem conservation strategy.
- 4) **Community Forestry**
As part of developing a community forestry strategy, four pilot projects are under way that allow communities to increase their decision-making role in the management of local forests.
- 5) **Private Woodlands Strategy**
A strategy to promote sustainable forestry on private lands and provide landowners with one-window access to government programs for woodland stewardship.
- 6) **Forest Audit**
The audit was completed in October 1992. It showed the status of regeneration in boreal areas cutover between 1970 and 1985.
- 7) **Economic Projects**
 - a) **Forest Values**
Development of a new forestry revenue system that reflects the financial values of both industrial and non-industrial (non-timber) uses of the forest.
 - b) **Timber Production Policy**
Development of options for securing a sustainable supply of timber to meet Ontario's social, economic and environmental needs.

Appendix E: Iles Sites in Site Region 4E



APPENDIX F

GLOSSARY OF TERMS

Areas of Natural and Scientific Interest: areas of land and water containing natural landscapes or features which have been identified as having values related to protection, natural heritage appreciation, scientific study or education, (Implementation Strategy: Areas of Natural and Scientific Interest, OMNR, 1988).

Biodiversity: (also known as biological diversity), the variety of life in all its forms, levels and combinations. Includes ecosystem diversity, species diversity, and genetic diversity, (IUCN/UNEP/WWF, Caring for the Earth, 1991).

Clearcutting: the removal in one operation of the entire commercial crop of a desired species of tree in one section of forest; clearcuts may be of different sizes or shapes, and are often done as block or strip cutting, (OMNR, "Forest Files", Spring 1988).

Conservation: the management of human use of ecosystems to ensure that such use is sustainable. Conservation includes protection, maintenance, rehabilitation, restoration, and enhancement of populations and ecosystems.

Ecological Land Classification/Forest Ecosystem Classification: Forest Ecosystem Classification is a type of Ecosystem Land Classification. Both are systems which attempt to provide a means to stratify a complex forest mosaic into more or less homogeneous land units, (K.R. Jones, paper presented at "Impact of Intensive Harvesting on Forest Site Productivity Workshop", March 5-12, 1989, New Zealand).

Ecological representation: the basis for selecting natural areas to represent the range of ecosystems found in Ontario. (Provincial Parks and Natural Heritage Policy Branch, OMNR, A Natural Heritage Areas Strategy for Ontario, 1992).

Ecosystem: a dynamic system of plants, animals and other organisms together with the non-living components of their environment, (IUCN/UNEP/WWF, Caring for the Earth, 1991).

Ecosystem approach: a holistic or ecological approach which considers the effect of specific actions or decisions on the functioning and health of the host ecosystem.

Endangered Spaces Initiative: a program announced by the Minister of Natural Resources in January 1992 to accelerate the process for completing the protection of endangered spaces in the province by the year 2000. Through this initiative, OMNR will meet targets consistent with those established by the World Wildlife Fund Canada's Endangered Spaces Campaign. The

campaign defines a protected area as a place where commercial logging, mining and hydroelectric development are not permitted. Hunting, tourism and other complementary activities may occur in appropriate circumstances. These criteria are consistent with the Ontario Provincial Park Policy, (OMNR Fact Sheet, January 1992).

Forest: an ecosystem dominated by trees, with their associated plants, animals and ecological processes.

Forest fragmentation: a change in the landscape from the continuous forest cover to a pattern of forest patches. There may be a progressive reduction in the number and size of forest patches. The degree of fragmentation is related to the spatial scale of the inventory, the similarity in the forest and non-forest patch cover, and the state of the pre-fragmented landscape.

Forestry: a profession embracing the science, business, and art of creating, conserving, and managing forests for the continuing use of their resources, (adapted from OMNR, Timber Management Planning Manual, 1986).

Geographic Information System: a set of software tools that allows staff to compile, store, retrieve, analyze, compare and display geographic information. It deals with the location, and physical properties of any object or feature in the real world.

Hectare: an area of land equal to 2.47 acres; about the size of two Canadian football fields.

Inventory: consists of statistics, maps, photographs and a computerized data base that provides information on each of the province's forest management units, (OMNR, "Forest Files", Spring 1988).

Landscape management: management with a view to having a specific mosaic of forest types across a landscape.

Management: when used in the term "forest resource management" refers, in this report, to any action or decision that is made regarding an area of forested land that is under the administration of a forest resource manager.

Management unit: a forest estate administered and operated according to one management plan. In Ontario three kinds of timber management units are common: (i) Crown management units, managed by OMNR; (ii) Company management units, managed by a company and OMNR jointly; and (iii) Forest Management Agreement forests which are managed by a company or agreement holder, and audited by OMNR.

New forestry: an approach to forest management developed for old growth Douglas fir forests of the western Cascades and coastal areas of Oregon and Washington; new forestry advocates managing forests as whole ecosystems, not just stands of timber; the philosophy is that sustaining biological diversity and maintaining long-term ecosystem health is the primary objective of forest management, and that timber management should be viewed as one by-product of this primary objective.

Old growth structural characteristics: include but are not limited to snags, trees with dead or dying tops, downed logs in various states of decay, and a multi-layered canopy.

Old growth forests: ecosystems characterized by the presence of old trees with their associated plants, animals, and ecological processes. They are reflective of the pre-settlement forest, (Ontario, Old Growth Policy Advisory Committee, 1993).

Pre-settlement forest: the forest that was present prior to European settlement; the distinction between pre- and post-European settlement acknowledges that there was a human presence and utilization of forests during pre-European times, but that the impacts of extensive agriculture, industry and extractive uses on the forest occurred following European settlement.

Production forest: all productive forest land managed primarily for growing timber for industry, unless otherwise reassigned, (OMNR, Timber Management Planning Manual, 1986).

Productive forest land: forest land that is capable of producing a merchantable stand within a reasonable length of time, (A Report on the Status of Forest Regeneration, 1992 from Canadian Forest Inventory Committee).

Protection: leaving a natural area in its natural state where management for ecological objectives, but not for consumptive use, may be allowed, (Ontario, Old Growth Policy Advisory Committee, 1992).

Seed-tree (harvesting operation): a clear cut save for a small number of seed bearers left singly or in small numbers, (OMNR, Timber Management Planning Manual, 1986).

Shelterwood cut: the removal of mature trees in a series of two or more cuts (in either entire stands or alternating strips); trees left standing provide seed and cover conditions for natural or artificial regeneration, (OMNR, "Forest Files", Spring 1988).

Shelterwood system: a silvicultural system where mature trees are harvested in a series of two or more cuts for the purpose of obtaining natural regeneration under shelter of the residual trees, (adapted from OMNR, Timber Management Planning Manual, 1986).

Silviculture: the science and art of cultivating forest crops; the theory and practice of controlling composition, constitution and growth of forests, (OMNR, "Forest Files", Spring 1988).

Site: an area defined by specific environmental conditions, such as soil, drainage, slope, soil type, etc.

Site district: a subdivision of a site region based on a characteristic pattern of landscape features, (Ontario Provincial Parks and Management Policies, 1978).

Site region: an area of land within which the vegetation responds to the influences of landform in a consistent pattern, (Ontario Provincial Parks Planning and Management Policies, 1978).

Snag: a standing dead tree, valued for its contribution to structural diversity and its habitat function.

Stand: a community of trees possessing sufficient uniformity in composition, age, arrangement, or condition to be distinguishable from adjacent communities, so forming an ecological entity (OMNR, Timber Management Planning Manual, 1986).

Stand management: management involving decisions relating to the species composition and physical structures of a stand (areas in the order of 10 to 100 hectares).

Succession: the natural progression in the life of a forest, where one plant community is gradually replaced with another.

Sustainable use: use of an organism, ecosystem or other renewable resource at a rate within its capacity for renewal, (IUCN/UNEP/WWF, Caring for the Earth, 1991).

Sustainable development: development which meets the needs for the present generation without compromising the ability of future generations to meet their own needs. (World Commission on Environment and Development, 1987).

Wild life: all wild mammals, birds, reptiles, amphibians, fishes, invertebrates, plants, fungi, algae, bacteria, and other wild organisms, (OMNR, Looking Ahead: A Wild Life Strategy for Ontario, 1991).

Working group: an aggregate of stands having the same predominant species, and managed under the same rotation and broad silvicultural system, (modified from OMNR Timber Management Planning Manual, 1986).

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